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ABSTRACT

The use of social software and virtual community platforms in particular promises to offer opportunities for customer integration into a company's value adding activities. Therefore, ideas and innovations generated by members of a virtual community can be analyzed and used in order to enhance the quality of products and services. However, evaluating economic consequences associated with the set-up, operation and maintenance of virtual communities on a quantitative basis has widely been neglected in social network research. Accordingly, no framework for valuation of web 2.0 applications has been established as yet. Thus, the objective of this paper is therefore to develop a measurement framework for the financial performance of a virtual community platform reflecting specific economic conditions relevant to a certain situation. The measurement framework is then applied to a real life example of the Berlin Stock Exchange.

Keywords

Virtual community, financial performance, measurement framework, capital budgeting, total costs of ownership, social software.

INTRODUCTION

Virtual communities offer new ways to create links between companies and their respective stakeholders (McAfee, 2005; O'Reilly, 2005, Wenger, McDermott and Snyder, 2002). Setting up a virtual community that is based on social software promises to improve the knowledge management in organisations and to enhance customer relationship management activities. A continuous participation of members can result in an increasing customer loyalty and allows for increased learning about preferences and opinions of customers (Lattemann and Stieglitz, 2007). Additionally, ideas that are generated by community members can be further analyzed to improve a company's value adding activities.

Though highly relevant there is still a lack of efficiency approval for virtual communities. Evaluating a virtual community in terms of a financial measure, a variety of aspects have to be considered, ranging from development, purchase, set-up and adaptation of a web 2.0 platform to community maintenance and business model related turnovers. To measure the financial performance of a web 2.0 platform, means of finance calculations and performance measures specific to the assessment of virtual communities have to be applied. The analysis of the financial performance usually reveals the overall profitability of the community implementation with measures such as the Return on Investment (ROI) or the Net Present Value (NPV). As is often the case only out-payments are readily quantifiable. In that case the financial performance may be reported by means of Total Costs of Ownership (TCO) analysis. In order to identify and assess relevant payments as the drivers of the financial performance, support for deriving, structuring and consolidating payments over time is required.

In this paper design principles of an appropriate measurement system for the financial performance of a virtual community set-up initiative will be presented. In order to find these principles, a design science approach is applied (Hevner, March, Park and Ram, 2004). Therefore, the concept of an appropriate measurement system is introduced on the basis of basic principles of decision theory and capital budgeting. The system is then applied to the case of the Berlin Stock Exchange which serves as a proof of the concept. Finally, major results as well as limitations are summed up and the demand for further research is pointed out.

RELATED WORK

Since the year 2000 new web-based collaboration technologies emerged and revolutionized the internet (O'Reilly, 2005; Sester, Eder and Scheichel, 2006; McAfee, 2005). In 2005 the term web 2.0 was coined by O'REILLY to comprise these applications and trends (O'Reilly, 2005). Web 2.0 applications are often associated with "social software". Whereas traditional software focuses on productivity and process support, web 2.0 applications focus on the linking of individuals and groups. Social software is based on different services for establishing networks and supporting the distribution of information within the network. Internet forums, wikis, web logs, instant messaging, RSS, pod casts and social bookmarking are tools of social software (O'Reilly, 2005; Bächle, 2006).

Web 2.0-driven social software comprises a couple of innovative technological approaches, which in particular are key elements of virtual community infrastructures. Virtual communities allow members to share knowledge, experiences, opinions, and ideas with each other. Community members could even be integrated into the value added process of a firm e.g. by generating and discussing innovations of products (Lattemann and Robra-Bissantz, 2005). Furthermore, virtual communities provide the means for enhancing the quality and efficiency of a customer relationship management (CRM). If customers can be successfully incited to participate in a virtual community, then the assumption can be made that they will increase their loyalty to the company, its products and services (Lattemann and Stieglitz, 2007).

Research shows that members of virtual communities are usually driven by a complex portfolio of motivations. This includes motives such as enjoyment in creating content or following specific values (Shah, 2003) or extrinsic aspects such as gaining a positive reputation in the community. These different motivations can be stimulated by a range of incentives and rules and regulations which are to be implemented in a governance system. Such a governance system has to consider all important drivers to increase voluntary and valuable contributions from community members.

Whilst implementing a virtual community, context specific characteristics have to be considered. In social oriented communities such as communities in the health sector (Leimeister and Krcmar, 2006) social aspects such as identity (Haring, 2002), values and ideologies (Gabriel and Goldmann, 2001) and affiliation (Haring, 2002) are of importance. In rather expert oriented communities such as communities for financial markets, motivation for participation is far more driven by the need for topical information (Shah, 2003), the enjoyment and the desire to create and improve (Gabriel and Goldmann, 2001) as well as training, learning and career concerns (Lakhani and von Hippel, 2003; Lerner and Tirole, 2002). Due to the diverse nature of virtual communities, their implementation and their management is not an easy task.

With their seminal work "Net Gain - Expanding Markets through Virtual Communities" HAGEL/ARMSTRONG (1997) developed a first framework for the implementation of virtual communities. They proposed four stages for the implementation. The first stage concentrates on attracting community members, the second stage focuses on fostering the members in the community, the third stage reflects loyalty aspects and the forth stage finally refers to business model issues. From an economic perspective efforts from the first three stages represent the investment in the community, whilst the last stage of implementation may yield appropriate returns. The difficulties of implementation in the community in the first stages are often substantial and contribute significantly to the total costs. However, no methods for measuring financial impacts are worked out.

As yet, only frameworks for measuring IT value by means of qualitative analysis have been proposed, like the "Impact/Value framework" by HAMMER/MANGURIAN (1987). Quantitative analysis is limited to detecting correlations between IT adoption initiatives and a firm's success in order to identify critical success factors. Analyses of monetary consequences are widely neglected and merely concentrate on short term measures (e. g. "IT costs/ turnover"). Setting up and maintaining a virtual community usually sets a long-term frame. Therefore, economic consequences should be analysed in more detail over a planning horizon spanning multiple periods.

However, in recent studies the emerging field of Value-Based Process Management is currently being elaborated. By reasoning in terms of Business-IT-Alignment these studies suggest several approaches for measuring financial implications of information system implementation and operation (Grob and vom Brocke, 2005; vom Brocke and Buddendick, 2007; vom Brocke, 2007). As these approaches have already been successfully applied in practical case studies, it seems promising to employ the methodological and empirical findings for measuring the financial performance of virtual communities. Hence, a corresponding framework will be introduced in the following chapter and than be applied in order to develop a financial perspective on virtual communities.

INTRODUCTION OF A MEASUREMENT FRAMEWORK FOR THE FINANCIAL PERFORMANCE OF A VIRTUAL COMMUNITY PLATTFORM

Calculations for reporting the economic efficiency of virtual communities can be arranged according to a general measurement framework introduced below (see Figure 1).This evaluation framework (given the shape of an 'E') is explicitly designed for the analysis of monetary consequences and distinguishes between three conceptual levels relevant for an evaluation of financial implications. On each level particular subjects for evaluation and corresponding analysis sections are suggested. Mandatory sections for executing the evaluations are marked grey.

The analysis of original payments is fundamental and provides a basis for the entire evaluation of the financial performance of a virtual community. On this level, payments (out-payments) and revenues (in-payments) brought about by the virtual community design and operation are analysed. Payments can be assessed manually or analytically derived and are based on an underlying quantity structure (e. g. the number of subscribers may be a determinant for the revenues). In- and out-payments are summed up to a series of payments, which serves as an interface for evaluations on subsequent levels. Derivative payments are analysed by considering additional parameters. Relevant parameters are derived from specific conditions of funding and taxes that a company has to face. That way, the series of payments can be consolidated over time by applying methods of capital budgeting in order to create a survey of financial consequences. Finally, the profitability of the virtual community design and operation has to be judged by means of financial performance measures. Measures like the Total Cost of Ownership (TCO) and the Return on Investment (ROI) help consider relevant parameters for this purpose (Seitz and Ellison 2004; Shapiro, 2004).

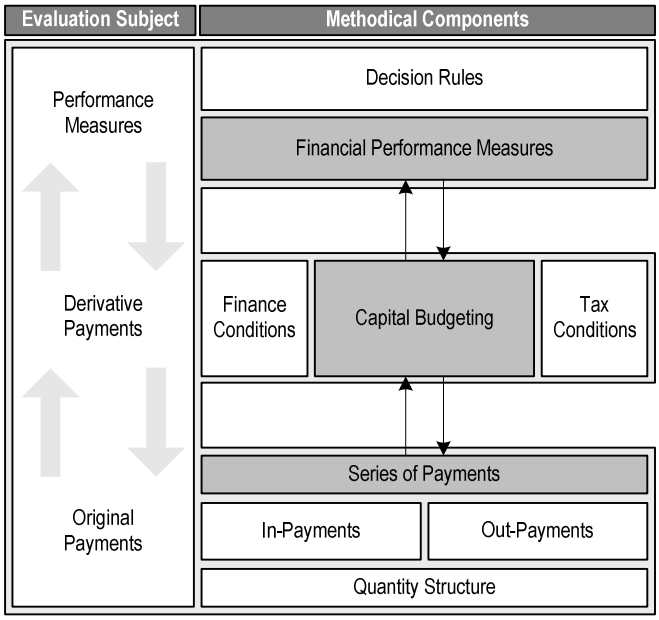

Figure 1. Measurement Framework

The level structure of the framework allows for separation of analysis concerns and therefore, special interest calculations can be employed in order to analyse, how changes on individual levels affect payments or measures on particular levels.

As for the capital budgeting and performance measurement well-established methods already exist (Grob, 1993; Higgins, 2006). Hence, the framework is designed in a way that these methods can be reused and integrated for the purpose of measuring the financial implication of virtual communities. In so doing the challenge is to find relevant in- and out-payments.

With regard to the specific payments that come along with the set-up of a virtual community platform, monetary consequences for development, operation, adaptation, and disintegration are to be assessed properly. A life cycle perspective helps identifying characteristic in-payments and out-payments accruing within particular stages of a virtual community adoption. Since a life cycle perspective sets a long-term frame, the assessment and calculation of relevant payments has to be conducted over a planning horizon spanning multiple successive periods. To be compliant with methods of capital budgeting, periods should have an equal length and are usually mapped to years or fractions of a year. Possible types of payments to be assessed in the context of virtual communities are presented in Figure 2. In addition to the listing of relevant payments, their

distribution over the planning horizon is highlighted by marking the main emphasis of each payment over the planning horizon. The list of payment types may be used as a reference template for measuring payments and can be customized in order to capture specific payments relevant to an individual context of a virtual community implementation.

Estimated Series of Payments for setting up a Virtual Community Platform				
Point in Time	Start	Year 1	…	Year n
Phase of Development (Analysis, Design, Implementation)				
Out-Payments				
- Definition of target group, analysis of preferences of target group				
- Building up know-how				
- Expertise of technical, legal, social, and economic environment				
- For project manager, analysis and preparation activities including project controlling (external part time position)				
- Implementation (in house)				
- For licenses with service providers				
Phase of Operation				
Out-Payments				
- Expertise of technical, legal, social, and economic environment				
- Research and analysis (external part time position)				
- For additional activities of department of public relations of Berlin Stock Exchange (in house)				
- For additional activities of market supervision (in house)				
- For moderation				
- For project manager, operational activities including project controlling (external part time position)				
- Awards and prices				
- For online-advertisement				
- Technical support (in house)				
- For running licenses				
In-Payments				
+ Savings due to increases customer self service				
+ Advertisement placements				
+ Membership fees				
Phase of Adaptation (Evolution)				
Out-Payments				
- Benchmarking analysis				
- Online survey				
- Project meetings (board, IT, PR) (in house)				
Phase Disintegration				
Out-Payments				
- for migration to another platform				
- for ongoing contracts				
- replacement of technology				
Series of Payments According to Partial Calculation				

Figure 2. Compiling the Series of Payments

Following a life cycle approach distinct phases can be derived. Our research shows that specific types of payments go along with virtual community implementation.

Payments for development typically relate to hard- and software provision, platform implementation efforts, build-up of know-how, administration and initial project management. In-payments will barely occur in this phase. During operations, costs for the maintenance work on information systems and user support usually apply (Faye Borthick and Roth, 1994). As for the context of virtual communities, additional payment types have to be considered. Out-payments for moderation, for online advertisements or for service provider hosting a virtual community platform serve as examples. Over time, adaptations will have to be carried out on the virtual community design and the underlying platform. These adaptations may be necessary in order to implement new functionalities, to modify existing ones or to adapt the scope of a virtual community. Examples for drivers of such adaptations are new insights on customer behaviour or changing demands. Finally, it has to be analysed, what payments can be foreseen in the phase of disintegration. Contractual payments like licence fees or penalty costs as well as payments for platform migration can serve as examples.

APPLICATION OF THE MEASUREMENT FRAMEWORK TO EVALUATE THE FINANCIAL PERFORMANCE OF A VIRTUAL COMMUNITY PLATFORM IMPLEMENTATION AT THE BERLIN STOCK EXCHANGE

Introduction

To demonstrate the applicability of the measurement framework introduced above, a practical case of setting up a web 2.0 virtual community at the Berlin Stock Exchange will be analysed.

The retail exchange industry shows a lack of information sharing between the retail investors and the stock exchanges in particular, because of the intermediation by investment banks. As private retail investors have only a direct link to their investment banks and not to the stock exchanges, there is no direct information flow and interaction between retail investors and stock exchanges. This causes a lack of information with respect to customer's preferences and wishes from the stock exchange micro structures. Moreover, the industry still lacks adequate trading facilities. To overcome these shortcomings a joined project was set up by the Berlin Stock Exchange in order to build up an innovative web 2.0 community platform for CRM purposes and to increase information transparency.

By establishing a web 2.0 online community at a stock exchange, two sequential objectives could be achieved. Retail investors and exchange operators could be linked closer together to enhance an efficient CRM. Subsequently this could result in a customer integration approach, where the retail investor is capable of determining the market model of the exchange trading system. The customer acts as a market engineer.

The project was realized with the Berlin Stock Exchange in cooperation with the authors in 2006 and 2007. The basic aim of the project was in particular to implement a web 2.0 platform to enable retail investors to contribute ideas to define the market models of the trading system of the exchange. With this approach customers are directly involved in the specification and design of market models and the stock exchange can adopt needs, desires, and wishes of private investors and thus extend their own service portfolio. Additionally, this virtual community was set up to increase customers` loyalty (Sester et al., 2006). This is a very important aspect of the stock exchange sector since retail investors are not so loyal to exchanges, as prices and service are of major importance to retail investors when choosing a financial market for stock trading.

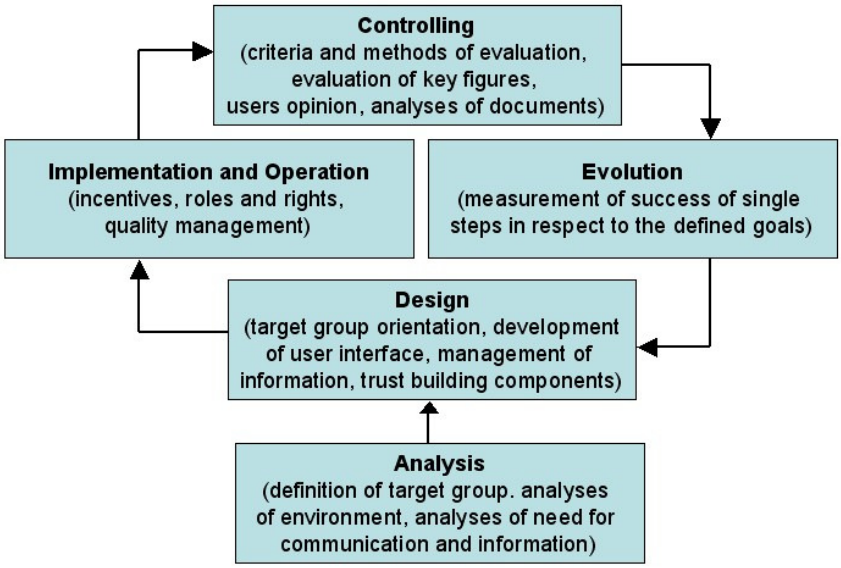

Figure 3. Process of Community Building and Community Management (Leimeister and Krcmar, 2006)

The project started in January 2006. The web based portal was implemented in July 2006 and featured several services such as a discussion forum, RSS-feeds, blogs, and chats with experts. To build up and operate an interactive web based community several aspects and steps have to be considered before the launch of the platform. Leimeister and Krcmar (2006) developed a community engineering model which describes the process of community building and community management. This approach is adopted in the described project. The community engineering approach covers the following five steps: (1) analysis, (2) design, (3) implementation and operation, (4) controlling, and (5) evolution.

The described exchange-community project comprised all these five steps. The project started in January 2006 with an analysis of key issues (attracting the exchange for retail investors, increasing the basis of active traders), the definition of a target group (retail investors) and a research of existing information- and telecommunication (ICT) infrastructure at the exchange and their attributes (e.g. interfaces, competences, technology).

A market research depicted that many retail banks already operate virtual retail communities and a large variety of internet stock investment platforms exists (among others www.wallstreet-online.de; www.tradesignal.com; www.yahoo.com; www.aktienboard.com). However, all these platforms aim at sharing market information for stocks and prices among traders. Joint discussions and forums among retail investors and exchanges about market modelling do not exist.

After a four month period of analyzing the *design phase* was conducted from May to July 2006. A technological platform, community governance mechanisms (Lattemann and Robra-Bissantz, 2006; Lattemann and Stieglitz, 2006) and the design of the graphical user interface were defined. The online exchange community was opened in July 2006 (implementation and operation phase) and thereafter continuously monitored and controlled (controlling phase). Within this time frame a lot of changes and additions to offered services, functionalities, and structure of the portal were planned and realized (evolution phase).

As success criteria for generating acceptance of web 2.0 community platforms, achieving critical mass and effectively providing means for coordination and mediation between community members are of major importance (cf. Kollmann, 2000). A first review conducted in the beginning of 2007 evaluated the degree of user participation comprising analysis of registrations, contributions and interactions. Figure 4 shows that between January 2007 and February 2007 the total number of registrations increased significantly. As a consequence, the slope of the total number of contributions increased since January 2007 (see Figure 5). A systematic and well planned use of governance instruments as well as the provision of appropriate means for coordination and mediation between members could be identified as one reason for the increasing activity of community members since February 2007 (Lattemann and Stieglitz, 2007). Moreover, the total number of members amounting to 400 in January 2007 can be regarded as the critical mass for the community needed to leverage the overall utility for both registered and potential participants.

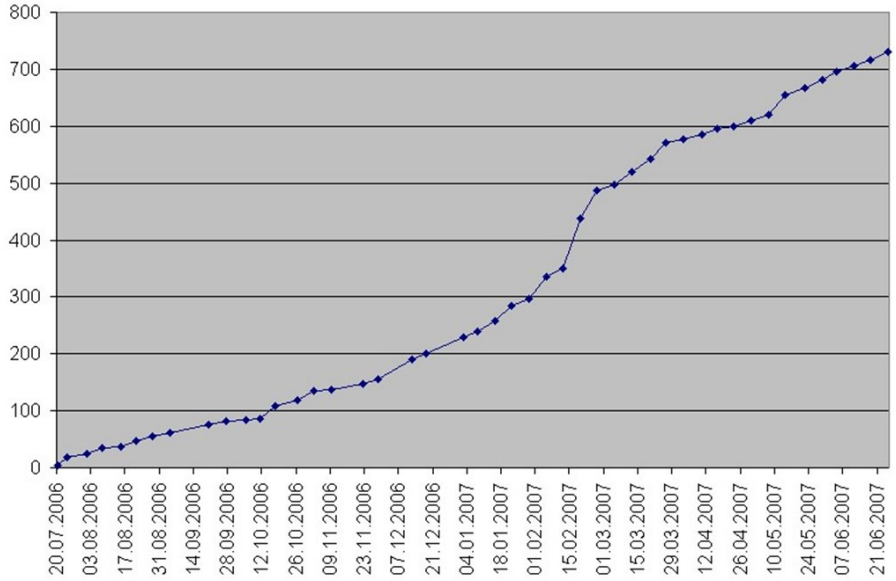

Figure 4. Cumulated Number of Registrations between July 2006 and June 2007

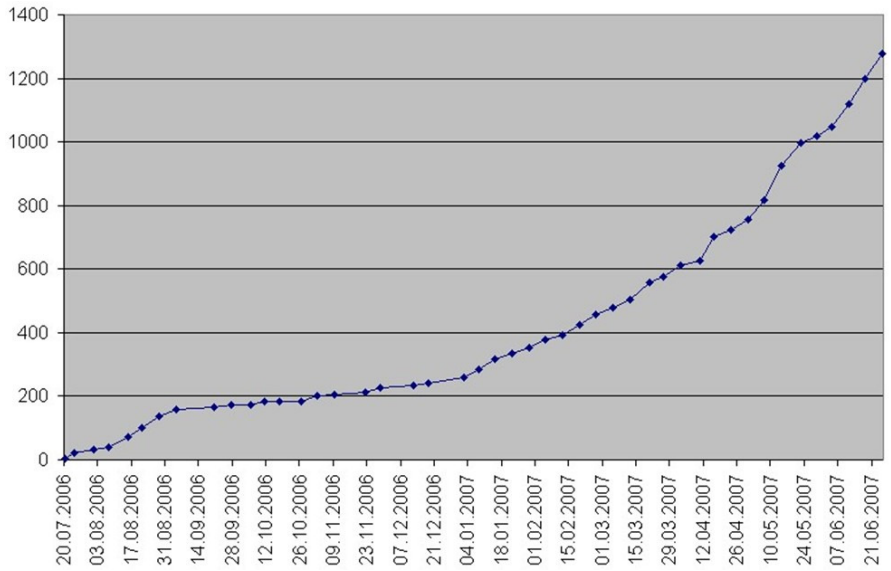

Figure 5. Cumulated Number of Contributions between July 2006 and June 2007

Since the initial qualitative evaluation of the virtual community acceptance lead to a positive review, the project partners agreed on an extension of the project's time frame. However, as essential qualitative project requirements were fulfilled an additional question about the financial consequences going along with community implementation arose. In the subsequent sections, the measurement framework presented above will be applied in order to report on the overall financial performance of the web 2.0 project.

Measurement of Original Payments

As stated above a life cycle perspective on virtual community platforms provides an appropriate means for identifying relevant payments. With regard to the process of the virtual community set-up and operation, the relevant payments accrue from analysis, design, implementation, governance, controlling and maintenance efforts. The steps of the community-engineering framework and their respective payments can easily be mapped to a general life cycle scheme, concluding the phases of development, operation, adaptation and disintegration. Hence, payments for analysis, design and implementation are jointly assigned to the phase of development. As for the controlling step, it is suggested that payments for controlling are estimated to occur throughout the whole life cycle of the virtual community and thus have to be considered within all phases.

The assessment of the payments on operational level led to the following initial situation for the described project (see Figure 6): The set-up of a virtual community in May 2006 went along with 3,400 € for building up know how, 1,000 € for project management (preparation, resource allocation and kick off) and 1,400 € for eliciting relevant design requirements. Costs incurred by implementing the virtual community platform at the stock exchange amounted to 1,500 €. Since the virtual community platform is hosted by a service provider 550 € have to be paid annually. The software for the platform has an open source license and therefore implies no costs.

Observations within the first month of operation show that payments for moderation efforts amount to 1,760 € per month. Continuous research analysis and project management make up another large fraction of relevant payments with 1,400 € per month. Further payments of 1,000 € per month are caused by online advertisement in the later stages of operation. Relevant in-payments could not be quantified at the time of writing. However, the Berlin Stock Exchange expects savings due to a relief of call centre personnel. The definite extent of savings is to be calculated in subsequent stages of the project.

Our findings from early stages of the virtual community operation suggest that adaptations are not necessary. However, payments for benchmark analysis and project meetings occurred in the later stages. As for the disintegration phase, contractual payments are rendered possible even though no judgement on this type of payments could be given yet.

To allow for a long-term analysis, all relevant payments have to be quantified periodically within the planning horizon. The payments listed in Figure 6 constitute the original monetary consequences for a planning horizon of three years. As for the year 2008, payments are fully estimated. Since no in-payments could be quantified yet, the resulting series of payments consists of out-payments only.

Estimated Series of Payments (Virtual Community at Berlin Stock Exchange)										
Point in Time	2006								2007	2008
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Phase of Development										
Out-Payments										
- definition of target group, analysis of preferences of target group	400									
- building up know-how	3400	3400								
- expertise of technical, legal, social, and economic environment	1000	1000								
- for project manager, analysis and preparation activities including project controlling (external part time position)	1400	1400								
- implementation (in house)	1500	1500								
- for licenses with service providers	550									
Phase of Operation										
Out-Payments										
- expertise of technical, legal, social, and economic environment			200	200	200	200	200	200	2400	1400
- research and analysis (external part time position)			1400	1400	1400	1400	1400	1400	13200	6900
- for additional activities of department of public relations of Berlin Stock Exchange (in house)			500	500	500	500	500	500	6000	4800
- for additional activities of market supervision (in house)			150	150	150	150	150	150	1800	1600
- for moderation		1760	1760	1760	1760	1760	1760	1760	18720	18720
- for project manager, operational activities including project controlling (external part time position)			1400	1400	1400	1400	1400	1400	10800	9300
- for online-advertisement					1000	1000	1000	500	600	600
- awards and prices		100		100		100		100	0	0
- technical support (in house)			500	500	1000	1000	500	500	6000	6000
- for running licenses									550	550
Phase of Adaptation (Evolution)										
Out-Payments										
- benchmarking analysis									600	600
- online survey									600	600
- project meetings (board, IT, PR) (in house)									1000	1000
Phase Disintegration										
Out-Payments										
- for migration to another platform										
- for ongoing contracts										
- replacement of technology										
Series of Payments	**-8250**	**-9160**	**-5410**	**-6010**	**-7410**	**-7510**	**-6910**	**-6510**	**-62270**	**-52070**

Figure 6. Detailed Series of Payments for the Virtual Community at the Berlin Stock Exchange

The assessment of the payments did not employ a quantity structure. Correlations between out-payments and particular quantities are considered implicitly (e. g. an increasing the number of community members may lead to increased coordination activities and therefore increased coordination costs). However, according to the general measurement framework above those correlations could be made explicit by defining relationships between quantity measures and out-payments with means of formulas.

Measurement of Derivative Payments

The assessment of original payments sets the basis for analysing derivative payments. In order to calculated derivative payments of the project the series of payments was processed with means of VOFI (*Visualization of Financial Implications*, Grob, 1993). The calculation is displayed in Figure 7. Since only out-payments are to be considered, the calculation was conducted by means of a Total Costs of Ownership VOFI. The actual financial performance of the virtual community adoption is indicated by the terminal value at the planning horizon in t=2008 and can be directly read out of the VOFI spreadsheet. In the present case the terminal value accounts for -93,357 €.

In order to consolidate the series of payments by means of VOFI, a periodic update of the capital stock has to be calculated. Starting in period zero, each period has to be calculated in a way that there is a balance between in- and out-payments. The following example may illustrate the essential procedure. In the first period, usually an out-payment has to be financed. If the internal funds available are insufficient, a loan has to be taken out. As usual, various conditions for loans can be agreed upon, and also a combination of various loans can be calculated in the VOFI. Correspondingly, multiple forms of funding can be included. As for the calculation above, interest rates for bullet loan, loan in current account and financial investment accounts for 4 per cent, 5 per cent and 3 per cent respectively.

In each period, the periodical in- and out-payments have to be balanced. As a check-up, the net funding value, which is defined as the accounting balance of all in- and out-payments, should be zero. On the basis of these flow figures, the capital

stock can be updated periodically. The accounting balance for loans and funds finally results in the net balance of the total investment. Within the spreadsheet, the value of an investment in a virtual community can be monitored for each period during the life-cycle simply by observing the net balance in each relevant period.

TCO-VOFI for the Virtual Community Implementation					
Point in time	**Start**	**2006**	**2007**	**2008**	**Sum**
Series of Out-Payments	8'250	48'920	62'270	52'070	171'510
Internal Funds					
- Withdrawals	10'000				
+ Equity Capital Cost				1'576	1'576
+ Deposits					
Financial Investment					
+ Reinvestment	1'750				
- Disinvestment		1'750			
- Creditor Interest (interest rate = 3 %)		53			53
Bullet Loan					
- Credit Intake					
+ Redemption					
+ Debtor Interest (interest rate = 4 %)					0
Loan in Current Account					
- Credit Intake		22'684	31'702	28'971	
+ Redemption					
+ Debtor Interest (interest rate = 5 %)			1'134	2'719	3'853
- Tax In-Payments (tax rate = 50 %)		24'434	31'702	27'395	83'530
Accounting Balance	0	0	0	0	
Capital Stock					
Balance on Financial Investment	1'750	0	0	0	
Equity Capital Employed	10'000	10'000	10'000	10'000	
Balance					
on bullet loan	0	0	0	0	
on current account	0	22'684	54'386	83'357	
Net Balance	**-8'250**	**-32'684**	**-64'386**	**-93'357**	

Figure 7. Aggregation of the Series of Payments within a modified VOFI

Measurement of the Financial Performance

On the basis of the detailed assessment of both original and derivative payments, performance measures can be calculated in order to allow for an economic evaluation of the virtual community initiative. Since the project is still in an early stage, only out-payments can be quantified. It is therefore sensible to reason on Total Costs of Ownership (TCO). The VOFI presented in the previous section allows for an easy calculation of TCO. The corresponding TCO-analysis for the virtual community adoption is given in Figure 8, which actually reports the Total Imputed Profit of the project.

As no in-payments can be imputed into the virtual community project yet, the calculation yields a loss. The reported negative profit corresponds to the TCO. However, this loss does not indicate that the project is unfavourable as such. As IT related projects usually do not generate direct cash inflows, the economic performance is frequently measured in terms of TCO. For reporting the TCO, the negative profit value should consequently be transformed into a positive value. The decision rule for designing virtual communities according to the TCO measure then is to minimize the corresponding TCO value. In the present case the TCO amount to 93,357 €. This value explains the current financial performance of the web 2.0 project. Calculating the TCO on a regular basis throughout the lifecycle of the community platform can contribute to a virtual community controlling by means of financial measures.

Total Profit of Ownership	
Total surplus of Payments for the Virtual Community-Platform	-171'510
+ Irregular Revenue	53
- Deprecation	0
= Total Monetary Profit (prior Interest and further Investments)	-171'458
- Interest Expense	3'853
= Montary Profit II (prior Taxes on Profit)	-175'311
+ Taxes on Profit	83'530
= Montary Profit III (after Taxes on Profit)	-91'780
- Imputed Interest	1'576
= Total Imputed Profit	-93'357
Total Costs of Ownership	**93'357**

Figure 8. Calculation of the Total Costs of Ownership

For TCO values to be more meaningful, the TCO analysis can be augmented with a benchmark analysis. This way, project alternatives (alternative virtual community design) or other projects similar in size and scope are compared in terms of economic efficiency. Design decisions related to a particular web 2.0 virtual community project should therefore aim at not only minimizing the TCO but at realizing a below average TCO. However, the TCO analysis exhibits a serious drawback. TCO values can only be compared with each other, if each project reports out-payments only.

CONCLUSION

Given the economic potential of social software and web 2.0 technologies to enhance a company's value adding activities, the challenge of evaluating the financial performance of respective technology adoptions arises. In particular, different types of payments specific to a virtual community adoption have to be considered appropriately. However, no framework for evaluating the economic efficiency of virtual community platforms has as yet been established.

Aiming at a measurement system for assessing the financial performance of a virtual community platform, findings on the financial implications on three levels of evaluation were presented in this paper. Due to the long-term economic consequences of virtual community projects, means of capital budgeting have to be employed in order to asses the economic consequences properly. From a methodological perspective the findings were summarised in a general framework and then applied by means of a practical example of the Berlin stock exchange.

Since in-payments accrued by the adoption, can hardly be quantified at this stage of the presented project, profitability is analysed in terms of Total Costs of Ownership (TCO). However, the first results basically proved the applicability of the measurement system. As the economic success of the implementation of a virtual community has to be proved throughout its life-cycle, the measurement system already constitutes a good tool for controlling and management of a virtual community.

As virtual communities, that are built up and operated so as to support CRM activities, do not generate direct profits (as in the present case), non-financial aspects should be considered, too. If financial measures like TCO and subjective qualitative assessments of the economic benefits are put into relation, each decision maker could balance an individual ratio. That way, monetary as well as non-monetary consequences can be considered and judged according to the individual preferences of the person in charge of virtual community adoption decision. The framework presented in this paper explicitly focused financial impacts of a virtual community implementation. Future research will concentrate both on the enlargement of the framework from various perspectives. However, the framework provides a basis for further research in this particular field of virtual community management.

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